Dyna-Gro SEED

Agronomic Bulletin

Leafing Out of Corn Underground

In addition to successful germination, successful emergence of corn seedlings is an important early step in successful stand establishment. The synchronization of coleoptile development and the cessation of mesocotyl elongation usually results in the appearance of the first leaf from the tip of the coleoptile just as the coleoptile breaks the soil surface. Occasionally, the first leaf instead emerges underground, often trapping the remainder of the young whorl below the soil surface, causing eventual stunting or death of the affected plant. Such leafing out underground can be caused by several factors. One factor may be physical restriction of coleoptile penetration through the soil due to dense surface soil crusting. A similar physical restriction of coleoptile penetration can occur in response to severe seed furrow sidewall compaction and heavy down-pressure settings on planter closing wheels.

A third possible cause of underground leafing is extended cool spring conditions and cool soil temperature. Chilling injury to mesocotyl or coleoptile plant tissue caused by sub-lethal cold temperatures during the emergence process. Such chilling injury can cause deformed development of the affected plant tissue, causing corkscrewing of mesocotyl that delays the emergence of the coleoptile prior to usual emergence of leaves from the coleoptile.

Light can penetrate through the soil surface of a cloddy seedbed. The corn plant spiking through the soil hits the sunlight and leaves unfurl before they reach the soil surface.

Sandy, course textured soils becoming very warm at the soil surface (0-1" depth) which can cause the coleoptile to stop growing and leaves unfurl below ground.